

PATENT ABSTRACTS OF JAPAN

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(54) ESSENCE OF FISHES AND ITS PRODUCTION

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain an essence of a fish free from smelling of fish and to provide a method for producing the essence.

SOLUTION: A raw material selected from an essence, a soup, a cooking drain and a soluble of a fish and their concentrated or diluted materials is adjusted to weak alkalinity of pH 7-10 and concentrated by heating under reduced pressure to give an essence of a fish having the content of nitrogen (TMA-N) in trimethylamine state based on total nitrogen amount of ≤ 2.5 mg/Ng.

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CLAIMS

[Claim(s)]

[Claim 1]A fishes extract, wherein content of trimethylamine voice nitrogen (TMA-N) to the amount of total nitrogen is 2.5 or less mg/Ng.

[Claim 2]The fishes extract according to claim 1 prepared by adjusting a raw material chosen from an extract of fishes, stock, steaming liquid, camber bulls, those concentration, or dilution to pH seven to 10 alkalinescence, and carrying out vacuum

concentration under heating.

[Claim 3]The fishes extract according to claim 1 or 2 in which said fishes are chosen from a bonito, a tuna, a sardine, a mackerel, and a horse mackerel.

[Claim 4]A manufacturing method of a fishes extract adjusting a raw material chosen from an extract of fishes, stock, steaming liquid, camber bulls, those concentration, or dilution to pH seven to 10 alkalence, and carrying out vacuum concentration under heating.

[Claim 5]A manufacturing method of the fishes extract according to claim 4 which carries out zymolysis of the raw material chosen from an extract of fishes, stock, steaming liquid, camber bulls, those concentration, or dilution beforehand, and subsequently performs vacuum concentration under said heating.

[Claim 6]A manufacturing method of the fishes extract according to claim 4 or 5 which adjusts a raw material chosen from an extract of fishes, stock, steaming liquid, camber bulls, those concentration, or dilution to Bx.10-30%, and subsequently performs vacuum concentration under said heating.

[Claim 7]A manufacturing method of a fishes extract of any one statement of claim 4-6 which heats to a temperature higher 10-30 °C than the boiling point of water under the same pressure as a pressure at the time of said vacuum concentration, and performs said vacuum concentration.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention relates to a fishes extract from which the raw bad smell was removed, and a manufacturing method for the same.

[0002]

[Description of the Prior Art]The extract extracted with the hot water of fishes (for example, a bonito, a tuna, a sardine, a mackerel, a horse mackerel, etc.), or alcohol, The taste peculiar to fishes of fishes extracts, such as stock obtained in the manufacturing process of autolysis of fishes, the extract which carried out zymolysis or a dried bonito, a dried mackerel, dried sardines, etc., and steaming juice produced at the time of fishes canned manufacture, is strong, and they are rich in nutritional information. Although these were used as various seasonings and a health food raw material, since the raw bad smell peculiar to fishes was strong, the use range was limited.

[0003]The trimethylamine (TMA) in which the raw bad smell of fishes is mainly generated by processing treatment, such as refrigeration and refrigeration, and subsequent heat-treatment, Originating in low molecular weight compounds, such as lower fatty acid, such as volatile base nitrogen (VBN), such as dimethylamine (DMA) and ammonia, a volatile carbonyl compound generated with oxidation of high-class unsaturated fatty acid, acetic acid which exists in a multi-fat fish, and butanoic acid, is known well.

[0004]In order to remove the above-mentioned raw bad smell ingredient, research is made from the direction of many and various kinds of methods are proposed. adding sugar for example, in °C fish-and-shellfishes extract -- this -- lactic acid bacteria -- the method (JP,54-5057,A) of making grow yeast youthfully and deodorizing. °C Add high molecular compounds, such as a protein nature substance and starch, in a fish-and-

shellfishes extract, A deodorization method processed using ultrafiltration membrane after heat-treating (JP,53-8786,B), ** It is a removing method (JP,7-289206,A) etc. of the raw bad smell by adding sugars in the method (JP,4-56585,B) and ** fish-and-shellfishes extract which stop a raw bad smell, dissolving in them, and heating at the temperature of around 130 °C by blending the salts of a lot of inosinic acid with a fish-and-shellfishes extract. There are a method, a steam distillation method, etc. for using the adsorbent which uses organic solvents, such as alcohol, such as a method and activated carbon.

[0005]

[Problem(s) to be Solved by the Invention]However, since the above-mentioned disposal method had complicated down stream processing, there were problems, like cost becomes high, or deodorization is insufficient and a raw bad smell remains.

[0006]For example, in the method of **, although a raw bad smell is removable to some extent, growing lactic acid bacteria or yeast will take time.

[0007]** In a method, it is thought that it is difficult that ultrafiltration membrane equipment is expensive and to restrict the amount of treating solutions and to process in large quantities industrially since ultrafiltration membrane processing takes time.

[0008]** In the method of **, it is thought that the aroma component generated by inosinic acid or a pyrogenetic reaction is masking the raw bad smell, and the raw bad smell ingredient is not removed fundamentally.

[0009]In addition, in a steam distillation method, as shown in the below-mentioned comparative example 2, removal of a raw bad smell ingredient is insufficient, and the manufacturing process of an extract will become complicated.

[0010]In which method of the above-mentioned ** - **, a raw bad smell ingredient was not able to be removed to such an extent that it could be satisfied practically.

[0011]Therefore, the purpose of this invention provides a fishes extract from which the raw bad smell ingredient contained in a fishes extract was fully removed, and a manufacturing method for the same.

[0012]

[Means for Solving the Problem]By making a fishes extract raw material into the alkalinity of a specific pH range, and carrying out vacuum concentration under heating, as a result of inquiring wholeheartedly that this invention persons should attain the above-mentioned purpose, A volatile base nature ingredient is removed efficiently, and it finds out that a fishes extract in which a raw bad smell was reduced substantially is obtained, and came to complete this invention.

[0013]That is, a fishes extract of this invention is characterized by content of trimethylamine voice nitrogen (TMA-N) to the amount of total nitrogen being 2.5 or less mg/Ng.

[0014]Since content of trimethylamine voice nitrogen (TMA-N) which is one of the volatile base nature ingredients as mentioned above is 2.5 or less mg/Ng, a fishes extract of this invention does not sense a raw bad smell almost, and can add it in various kinds of eating-and-drinking articles.

[0015]As for the above-mentioned fishes extract, it is preferred to be prepared by adjusting a raw material chosen from an extract of fishes, stock, steaming liquid, camber bulls, those concentration, or dilution to pH seven to 10 alkalinescence, and carrying out vacuum concentration under heating.

[0016]It is preferred that said fishes are chosen from a bonito, a tuna, a sardine, a

mackerel, and a horse mackerel.

[0017]On the other hand, a raw material chosen from an extract of fishes, stock, steaming liquid, camber bulls, those concentration, or dilution is adjusted to pH seven to 10 alkalinescence, and a manufacturing method of a fishes extract of this invention carries out vacuum concentration under heating.

[0018]According to the manufacturing method of a fishes extract of this invention, by adjusting a fishes extract raw material to the alkalinity of the above-mentioned specific pH range, and carrying out vacuum concentration under heating, a volatile base nature ingredient can be removed efficiently and a fishes extract in which a raw bad smell was reduced substantially can be obtained.

[0019]In this case, it is preferred to carry out zymolysis of the raw material chosen from an extract of fishes, stock, steaming liquid, camber bulls, those concentration, or dilution beforehand, and to perform vacuum concentration under said heating subsequently.

[0020]It is preferred to adjust a raw material chosen from an extract of fishes, stock, steaming liquid, camber bulls, those concentration, or dilution to Bx.10-30%, and to perform vacuum concentration under said heating subsequently.

[0021]It is preferred to heat to a temperature higher 10-30 °C than the boiling point of water under the same pressure as a pressure at the time of said vacuum concentration, and to perform said vacuum concentration.

[0022]

[Embodiment of the Invention]As a raw material for manufacturing the fishes extract of this invention, The extract extracted and disassembled from fishes for the purpose of manufacture of an extract by all methods, Or the stock secondarily generated on the occasion of fishes processings (for example, dried bonito manufacture, dried-sardines manufacture, canned manufacture, etc.), It is the autolysate of the fluid containing the extractive matter of fishes, such as steaming juice, and fishes internal organs, or the camber bull which carried out zymolysis, for example, a sardine extract, a bonito extract, a tuna extract, a horse mackerel extract, a bonito camber bull, etc. are mentioned.

[0023]The fishes extract of this invention is obtained by removing a raw bad smell ingredient from the above-mentioned fishes extract raw material by the following methods. this deodorization process adds a pH adjuster first in the above fishes extract raw materials (usually pH five to 6 alkalinescence) -- pH 7-10 -- it adjusts to pH 7.5-8.5 preferably. When pH is lower than seven, the removing effect of a raw bad smell ingredient is weak, and when pH is higher than ten, since destruction of nutritional information including protein or flavor is expected by heating under strong-base nature, it is not desirable. As the above-mentioned pH adjuster, although the shape of a commercial flake or liquefied sodium hydroxide, sodium carbonate, sodium bicarbonate, etc. are mentioned, if it is alkali chemicals usable to foodstuffs, there will be no restriction in particular. PH adjustment is made by supplying agitating the above alkali chemicals, after performing pretreatment which is later mentioned if needed in the above-mentioned fishes extract raw material.

[0024]Subsequently, vacuum concentration is carried out under heating of the fishes extract raw material by which pH adjustment was carried out [above-mentioned]. The cooking temperature in vacuum concentration is suitably adjusted with the degree of vacuum of a depressurizing system. Usually, 300 or less torr of degrees of vacuum of a vacuum concentration device are 80 or less torr preferably, and, as for cooking

temperature, it is desirable to make preferably about 15-20 °C of 10-30 °C higher than the temperature at which the water under the degree of vacuum can be boiled with the degree of vacuum of a vacuum concentration device. It will be condensed, before concentration speed will be too quick and a raw bad smell ingredient will be removed, if there is no deodorizing effect that the above-mentioned cooking temperature is less than 10 °C not much and it exceeds 30 °C.

[0025] Since it is an almost volatile low molecular weight compound, it is theoretically removable with vacuum concentration also at low temperature, but actually, a fishes extract consists of various ingredients, and since the above-mentioned raw bad smell ingredient harmonizes with other compounds and is in the azeotropy state, it cannot remove a raw bad smell ingredient easily. When concentration progresses, since viscosity rises, the raw bad smell ingredient contained in the inside becomes difficult to evaporate, and the concentration under a high vacuum degree is more needed, but. If alkalescence is used and heat is applied simultaneously with decompression, an extract will be in a fine boiling state, a raw bad smell ingredient will also go up on an oil level with evaporation of moisture, and it will become easy to remove.

[0026] The degree of concentration can be arbitrarily set up with the removal efficiency by the kind of fishes extract, quantity, vacuum concentration capacity rating of a raw bad smell ingredient which are included, etc. Generally, concentration time is long, or it is so effective for removal of a raw bad smell that enrichment is high.

[0027] In the desirable mode of this invention, before removing a raw bad smell ingredient, suitable pretreatment may be performed according to the state of a fishes extract. case [for example,] (less than ex.Bx.10%) there are few extractive matters contained in a fishes extract -- beforehand -- a raw material -- Bx. -- it is more desirable to go into a deodorization treatment process about 10 to 30%, after condensing to about Bx. 15-20% preferably. If vacuum concentration is adjusted and carried out to alkalinity as it is, without pretreating, when the quantity of the alkali chemicals used for pH adjustment increases relatively to an extractive matter and condenses, the salt concentration of an extract will become high, and the use range will be restricted as a seasoning.

[0028] It is more desirable to perform a deodorization process, after disassembling and carrying out depolymerize of the steaming juice by protease etc. beforehand when a fishes extract contains many polymers protein and peptide. For example, since many gelatin eluted from a fishskin, a fishbone, etc. on the occasion of steaming processing is contained, if vacuum concentration of the steaming juice of a bonito and a tuna is carried out as it is, before a raw bad smell ingredient is removed, an extract will become paste state and it will become impossible to continue concentration. There is no restriction in particular about the reaction temperature and time in a kind, quantity, and zymolysis, such as protease used, and the flavor of an extract cannot be impaired, but what is necessary is just to be able to carry out depolymerize of protein and the peptide to some extent.

[0029]

[Example] Hereafter, an example is given and this invention is explained concretely. Vacuum concentration was carried out with the conventional method by having considered as pretreatment 10 kg (Bx.5.6%) of sardine stock which carries out a byproduct at the **** process in example 1 dried-sardines manufacture, and the

concentrate (Bx.20%) was obtained. Protease of 0.1% of the weight of marketing was added to said amount of concentrates, and zymolysis of the 50 ** was carried out for 3 hours. After adjusting 1 kg of zymolysis liquid the pH to 8 with caustic-alkali-of-sodium liquid 48%, vacuum concentration was carried out to Bx.60% under the degree of vacuum of 75 ** and 75torr, and the concentrate 330g of 2.3% of total nitrogen (T-N) was obtained.

[0030]1 kg of zymolysis liquid of the sardine stock prepared like comparative example 1 Example 1 was adjusted the pH to 5 with 6N chloride, under the degree of vacuum of the same deodorization treatment conditions as Example 1, i.e., 75 **, and 75torr, vacuum concentration was carried out to Bx.60%, and the concentrate 335g of 2.5% of total nitrogen (T-N) was obtained.

[0031]the example 1 of an examination -- about the liquid (Bx.20%) before the deodorization treatment of Example 1 and the comparative example 1 which were acquired in this way, and the liquid after deodorization treatment. Each trimethylamine voice nitrogen (TMA-N) content, an ammonia content, And the ratio of the absolute magnitude of the removed same ingredient to the absolute magnitude of the raw bad smell ingredient contained in the liquid before deodorization treatment which analyzes a volatile-base-nitrogen (VBN) content and is called for by the one following was computed as an extraction ratio, and it was shown in Table 1.

[0032]

[Equation 1]Extraction ratio [%] = (front [deodorization treatment] component amount- deodorization treatment epigenesis daily dose) / front [deodorization treatment] component amount [0033]A trimethylamine voice nitrogen (TMA-N) content, It measured by the picrate method (the volume a "food analysis method", Japanese food-stuff-industry meeting, and on food analysis method member-of-editorial-board meeting, October 20, Showa 57 issue, p.673-676) which makes a picrate TMA made to shift to an organic layer, and carries out spectrometry with a strong base. In the reaction of 2-oxoglutarate+NADH+NH₄⁺->L-glutamate+NAD⁺+H₂O an ammonia content, Since the quantity of NADH (the coenzyme which participates in redox enzyme: reduction type of nicotinamide adenine dinucleotide) consumed was equivalent to the amount of ammonia, the considerable amount of ammonia was computed from reduction of the absorbance in 340 nm. The volatile-base-nitrogen (VBN) content was measured with the microdiffusion method.

[0034]

[Table 1]

| | 実施例 1 (pH8) | | | 比較例 1 (pH5) | | |
|-------------|-------------|-------|------|-------------|-------|------|
| | TMA-N | アンモニア | VBN | TMA-N | アンモニア | VBN |
| 処理前 (mg/Ng) | 8.93 | 29.4 | 37.4 | 8.93 | 29.4 | 37.4 |
| 処理後 (mg/Ng) | 2.02 | 5.4 | 9.7 | 8.67 | 27.5 | 35.1 |
| 除去率 (%) | 77.4 | 81.6 | 74.1 | 2.9 | 6.5 | 6.1 |

[0035]As shown in Table 1, in Example 1 condensed to Bx.60%, an about [Bx.20%] fishes extract with the vacuum concentration under alkalescence. By the comparative example 1 which performed vacuum concentration in the acescence, it turned out that a raw bad smell ingredient is hardly removed, but remains in a concentrate to having removed not less than 70% of the raw bad smell ingredients contained in the fishes

extract. Thus, it turned out that the vacuum concentration under alkalinity is a method very effective in removal of a raw bad smell ingredient.

[0036] Vacuum concentration was carried out with the conventional method by having considered as pretreatment 20 kg (Bx.9.2%) of tuna steaming juice obtained by the steaming step in manufacture of Example 2 and comparative example 2 tuna canning, and the concentrate (Bx.20%) was obtained. After carrying out temperature up of said concentrate to 80 **, carrying out 1 evening settlement and removing oil, it added 0.2% of the weight to the solid content of liquid, and zymolysis of 50 ** of the commercial protease was carried out for 2 hours. After adjusting each 1 kg of this zymolysis liquid (Bx.20%) the pH to 8.5 with 48% caustic-alkali-of-sodium liquid with pH un-adjusting (comparative example 2) (pH 5.5) (example 2), vacuum concentration was respectively carried out to Bx.60% under the degree of vacuum of 70 ** and 75torr.

[0037] And TMA-N, ammonia, and the VBN content of the liquid (Bx.20%) before each deodorization treatment and the liquid (it converted into the weight before deodorization treatment) after deodorization treatment were measured, and it was shown in Table 2.

[0038]

[Table 2]

| | | 実施例 2 | 比較例 2 |
|----------------|-------------|--------|--------|
| | | pH 8.5 | pH 5.5 |
| TMA-N | 処理前 (mg/Ng) | 7.3 | 7.3 |
| | 処理後 (mg/Ng) | 1.1 | 6.7 |
| アンモニア | 処理前 (mg/Ng) | 55.1 | 55.1 |
| | 処理後 (mg/Ng) | 6.4 | 47.2 |
| VBN | 処理前 (mg/Ng) | 63.2 | 63.2 |
| | 処理後 (mg/Ng) | 13.3 | 58.9 |
| 遊離アミノ酸 (mg/Ng) | | 3,374 | 3,456 |

[0039] As shown in Table 2, pH 8.5 removing effect is dramatically remarkable, and TMA-N of the liquid after deodorization treatment and the ullage of ammonia had only 16.4% of that in pH5.5, and 13.6%, respectively.

[0040] Although it was apprehensive about destruction of nutritional information including protein by the pyrogenetic reaction in alkalinity, in the method of this invention, it turned out that a free amino acid content does not have fear of nutritional information destruction practically equal, either.

[0041] The examination same about 14 articles, such as a bonito extract of example 3 marketing, a tuna extract, and a camber bull, was done. Since viscosity was high about the bonito extract C and the tuna extract A, it processed by commercial protease a priori by the same method as Example 1. Other samples were used as they were. 500 g of each sample was taken, this was diluted with demineralized water to 1500 g, and vacuum concentration was carried out to the original weight under the degree of vacuum of 70 ** and 75torr after adjusting the pH to 8.0 with caustic alkali of sodium 48%. TMA-N of a

concentrate, ammonia, and the analytical value of VBN were shown in Table 3.

[0042]

Table 3]

| サンプル | ロットNo. | TMA-N | | | アンモニア | | | VBN | | |
|-----------|--------|---------------|----------------|------------|---------------|----------------|------------|---------------|----------------|------------|
| | | 元液 (mg/kg) | 脱臭液 (mg/kg) | 除去率 (%) | 元液 (mg/kg) | 脱臭液 (mg/kg) | 除去率 (%) | 元液 (mg/kg) | 脱臭液 (mg/kg) | 除去率 (%) |
| カツオエキスA | 980128 | 6.9 | 1.6 | 76.8 | 28.8 | 10.0 | 65.3 | 30.8 | 8.0 | 74.0 |
| | 980401 | 6.5 | 1.1 | 83.1 | 23.5 | 5.5 | 76.4 | 27.9 | 8.8 | 68.5 |
| | 980909 | 6.2 | 1.2 | 80.6 | 23.3 | 9.1 | 60.9 | 31.0 | 9.0 | 71.0 |
| カツオエキスB | 980819 | 5.8 | 1.4 | 75.9 | 19.8 | 7.6 | 61.6 | 24.0 | 9.5 | 61.4 |
| | 980922 | 6.0 | 1.2 | 80.0 | 22.9 | 7.9 | 65.5 | 27.3 | 9.0 | 67.0 |
| | 980717 | 4.3 | 0.8 | 81.4 | 20.3 | 4.3 | 78.8 | 21.8 | 5.0 | 77.1 |
| マグロエキスA | 980820 | 4.4 | 0.9 | 79.5 | 28.6 | 4.3 | 76.9 | 20.0 | 5.7 | 71.5 |
| | 980918 | 4.7 | 0.9 | 80.9 | 20.2 | 5.0 | 75.2 | 20.4 | 5.0 | 75.5 |
| | 980723 | 3.8 | 0.7 | 81.6 | 12.0 | 1.5 | 87.5 | 16.6 | 2.8 | 83.1 |
| カツオエキスC | 980930 | 3.7 | 0.6 | 83.8 | 13.5 | 2.6 | 80.7 | 17.7 | 4.3 | 75.7 |
| | | | | | | | | | | |
| アジソリブル | | 10.0 | 1.8 | 82.0 | 19.9 | 6.5 | 67.3 | 51.1 | 18.0 | 64.8 |
| カツオソリブル | | 7.7 | 1.4 | 81.8 | 25.7 | 9.7 | 62.2 | 30.7 | 10.0 | 67.4 |
| フィッシュソリブル | | 10.9 | 2.5 | 77.1 | 31.4 | 10.6 | 66.2 | 34.8 | 13.5 | 61.2 |
| マグロエキスB | | 4.5 | 0.7 | 84.4 | 19.4 | 7.1 | 63.4 | 25.1 | 8.5 | 66.1 |

[0043]As shown in Table 3, the remarkable raw bad smell ingredient was contained in the commercial fishes extract, but by carrying out deodorization treatment by the method of this invention showed that each raw bad smell ingredient was removed no less than about 60 to 80%.

[0044]In order to check the existence of generating of the flavor of the fishes extract from which the raw bad smell was removed by the method of example 4 this invention, and the reversion flavour under preservation, After diluting the commercial bonito extract (Bx.65%) 3 times and adjusting it the pH to 8 with caustic-alkali-of-sodium liquid 48%, vacuum concentration was carried out to Bx.65% under 75 ** and 75torr degree of vacuum.

[0045]Then, after neglecting it to a room temperature for three months with a commercial bonito extract undiluted solution, ten skillful panelists performed organic-functions evaluation. The result is shown in Table 4.

[0046]

Table 4]

| | 元液 | 脱臭液 |
|----------|-----|-----|
| 脱臭処理直後 | 2.8 | 1.1 |
| 密蓋3カ月保存後 | 2.9 | 1.3 |

評価基準 3点：強く感じる、2点：やや強く感じる

1点：僅かに感じる、0点：感じない

[0047]As shown in Table 4, as for the bonito extract deodorized by the method of this invention, after the preservation for three months hardly sensed a raw bad smell.

[0048]At 95 **, through the steam of 45 L/min, steam distillation was performed for 1 hour to what adjusted the pH to 8.5 with caustic-alkali-of-sodium liquid 1 kg of zymolysis liquid (Bx.20%) of the tuna steaming juice used by comparative example 3 Example 2 and the comparative example 2 48%, and the treating solution 665g was obtained to it. This treating solution was prepared in the weight processing before with demineralized water, that TMA-N, ammonia, and a VBN content were analyzed, and it was shown in Table 5 as compared with the data before processing.

[0049]

[Table 5]

| | TMA-N | アンモニア | VBN |
|------------------|-------|-------|------|
| マグロ煮煮液元液 (mg/Ng) | 7.3 | 55.1 | 63.2 |
| 水蒸気蒸留処理液 (mg/Ng) | 3.9 | 54.5 | 49 |
| 除去率 (%) | 46.6 | 1.1 | 22.5 |

[0050]As shown in Table 5, although TMA-N was removed 46.6%, the steam distillation under alkalescence of removal of other raw bad smell ingredients was insufficient, and it turned out by it that it remains without hardly removing ammonia in particular.

[0051]

[Effect of the Invention]As explained above, according to this invention, the raw bad smell ingredient contained in fishes extracts, such as a sardine extract, a bonito extract, and a camber bull, is easily and effectively removable. The fishes extract prepared by the method of this invention does not sense a raw bad smell, but is available in a broad field.